Patent

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appellants:	STEEGHS, H., et al.	Examiner:	M. Andrews
Serial No.:	08/032,525	Group Art Unit:	1742
For:	Process for Agglomerating Particulate Material and Products Made from such Processes	Docket No.:	ASC 5695 US1
		Filing Date:	March 15, 1993

Hon. Commissioner of Patents and Trademarks
Washington, D.C. 20231

APPEAL BRIEF

I. INTRODUCTION

Pursuant to the provisions of 35 U.S.C. §134 and 37 C.F.R. §§1.191 and 1.192, this paper is submitted as a brief setting forth the authorities and arguments upon which Appellant relies in support of the Appeal from the Final Rejection of Claims 1, 3, 7, 8, 45 and 50 dated October 11, 2001. Claims 17, 19-21 and 47 remain subject to appeal to Federal Court, since there has been no final decision in this case.

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II. REAL PARTY IN INTEREST

The real party in interest in the present case is the assignee, Akzo Nobel N.V.

III. RELATED APPEALS AND INTEREFERENCES

Upon information and belief the applicant/assignee and applicant's/assignee's representative know of no pending or anticipated appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

IV. STATUS OF THE CLAIMS

Claims 1, 3, 7, 8, 9, 17, 19, 20, 21, 23, 40-43, 45, 46, 47, 48, 49 and 50 are pending, claims 9, 23, 40-43, 46, 48 and 49 were withdrawn from consideration as being directed to a non-elected invention, claims 2, 4-6, 10-16, 18, 22, 24-39 and 44 were cancelled, and claims 1, 3, 7, 8, 45 and 50 stand herein on Appeal. Claims 17, 19-21 and 47 remain subject to appeal to Federal Court, since there has been no final decision in this case.

V. STATUS OF THE AMENDMENTS

No amendments to the claims were made subsequent to final rejection.

VI. SUMMARY OF THE INVENTION

The claimed invention involves a process of agglomerating metallic ore (page 1, lines 4-7). The process commingles metallic ore with a moistening effective amount of water (page 3, lines 15-18), a binding effective amount of a polymer (page 3, lines 18-19) chosen from guar, guar derivatives and mixtures thereof (page 4, lines 9-19), and a binding effective amount of a weak acid (page 3, lines 19-20) chosen from citric acid, malic acid, tartaric acid and mixtures thereof (page 5, lines 6-9) to produce a mixture and forms the mixture into agglomerates (page 3, lines 20-21). The inventive process results in agglomerates having improved drop numbers and crush strength compared with agglomerating processes which only employ a binding effective amount of a polymer.

VII. ISSUES

There are two issues to be resolved herein on Appeal:

1. Is the rejection of claims 1, 3, 7, 8 and 45 under 35 U.S.C. §103 as allegedly being unpatentable over Banyai in error?

2. Is the rejection of claim 50 under 35 U.S.C. §103 as allegedly being unpatentable over Banyai and further in view of Roorda in error?

VIII. GROUPING OF CLAIMS

With respect to the first ground of rejection, claims 1, 3, 7, 8 and 45 stand or fall together. Claim 50 is the only claim rejected under the second ground of rejection.

IX. ARGUMENT

The arguments presented herein apply to both rejections, unless explicitly noted.

There are at least three reasons why Banyai does not make obvious the claimed process of agglomerating metallic ore by commingling the metallic ore with a moistening effective amount of water, a binding effective amount of guar, guar derivatives or mixtures thereof, and a binding effective amount of a weak acid selected from the group consisting of citric acid, malic acid, tartaric acid and mixtures thereof to produce a mixture and forming said mixture into agglomerates.

The rejection is based on Banyai's disclosure of guar and its disclosure of sodium citrate. Firstly, Banyai does not provide any reason to employ a binding effective amount of guar and sodium citrate in a process of agglomerating ore. Secondly, even if it did, the claimed process employs guar and/or its derivatives and a weak acid of citric acid, malic acid, and/or tartaric acid, not the sodium

guar + sodium citrate

not sodium citrate

citrate in Banyai. Thirdly, even if Banyai's disclosure of sodium citrate were equated with the claimed citric acid, any prima facie case of obviousness is overcome by the claimed invention's unexpected results.

unexpected results

A. No motivation to select

Banyai does not disclose a process of agglomerating metallic ore utilizing a binding effective amount of guar and/or its derivatives and a binding effective amount of a weak acid of citric acid, malic acid, and/or tartaric acid. It is alleged that a binder of guar and citric acid is obvious based on Banyai's disclosing guar and sodium citrate. However, Banyai does not teach or suggest a binder of guar and sodium citrate.

The Examiner contends that it would have been obvious to "formulate a binder including guar and sodium citrate because they are disclosed as suitable for the Banyai et al. formulation." Page 2 of the Final Action dated October 11, 2001 ("Final Action"). However, they are not disclosed as a binder; there is no direction to chose these substances as a binder; and, indeed, Banyai's disclosure teaches away from selecting sodium citrate as a binder.

Banyai discloses an ore agglomerating binder composition of "(a) an alkali metal salt of carboxymethyl cellulose or carboxymethyl hydroxyethyl cellulose and (b) sodium tripolyphosphate." Col. 1, ll. 12-16. It also discloses that

> [t]he binder composition may also contain other substances, for instance, those that are formed as by-products in the preparation of the alkali metal salt of carboxymethyl cellulose, such as sodium chloride and sodium glycolate, as well as other polysaccharides or synthetic water-soluble polymers and other "inorganic salts" (for want of a better term sodium carbonate, sodium citrate, and the like are referred to as "inorganic salts" herein). Exemplary polysaccharides include, e.g., hydroxyethyl cellulose, hydroxypropyl cellulose, hydrophobically modified hydroxyethyl cellulose, methyl cellulose, hydroxypropyl methyl cellulose, guar, hydroxypropyl guar and sugar beet pulp, etc. Exemplary synthetic water-soluble polymers

include polyacrylamide, polyvinyl alcohol, styrene/maleic anhydride copolymers, and polyacrylate, etc. Exemplary inorganic salts include, e.g, the salts described by Roorda in U.S. Pat. Nos. 4,288,245 and 4,597,797, such as sodium carbonate, sodium citrate, etc., and other phosphate salts, such as monosodium phosphate (sodium phosphate mono basic), disodium phosphate (sodium phosphate di basic), sodium tripolyphosphate, tetrapotassium pyrophosphate, tetrasodium pyrophosphate, and sodium metaphosphate [$(NaPO_3)_n$ wherein n is 2 or more (sodium metaphosphate wherein n is 6, 13 and 21 are commercially available from FMC Corporation)].

Banyai, col. 3, l. 61-col. 4, l. 18.

This list of other substances is quite large. It includes any conceivable polysaccharide, synthetic water-soluble polymer, or inorganic salt and names over 22 examples of polysaccharides, synthetic water-soluble polymers, and inorganic salts (including the salts in Roorda in U.S. Pat. Nos. 4,288,245 and 4,597,797, phosphate salts generically and any number of sodium metaphosphate where n is 2 or more). Included in these examples are guar and sodium citrate. However, nothing in Banyai says the "other substances" in its list have a binding effect or that they have any effect. They just may end up in the composition. This is emphasized by the fact that the primary example of these other substances are "by-products in the preparation of the alkali metal salt of carboxymethyl cellulose, such as sodium chloride and sodium glycolate." Banyai, col. 3, ll. 62-65.

Accordingly, Banyai does not disclose guar and sodium citrate as a binder. This lack of direction in Banyai to chose these substances as a binder is further emphasized by the disclosure of binding additives (clay binders and strength enhancing flux) in a separate section of the patent, col. 5, ll. 23-33. Thus, there is no motivation in Banyai to select guar alone or in combination with sodium citrate as a binder.

Indeed, Banyai teaches away from using sodium citrate as a binder because it uses it in comparative examples to demonstrate the advantages of Banyai's particular sodium tripolyphosphate over other salts. Sodium citrate is

used as a comparison salt in the examples shown in Table 3 (sample 3-13 with sodium citrate as the salt compared to samples 3-3 and 3-4 with sodium tripolyphosphate as the salt in Banyai's binder) and Table 5 (sample 5-7 with sodium citrate as the salt compared to sample 5-2 with sodium tripolyphosphate as the salt in Banyai's binder) cols. 7-10.

There must be some motivation to select the claimed species or subgenus from the reference. In re Baird,29 USPQ2d 1550 (Fed. Cir. 1994). In general, to establish the obviousness of a particular combination, there must be some suggestion or motivation in the prior art. In re Fritch, 23 USPQ2d 1780 (Fed. Cir. 1992).

As discussed above, the rejection is based on the selection of both guar and sodium citrate from a combined genus/species list of any polysaccharide, synthetic water-soluble polymer, or inorganic salt which are possibly present in a binder composition as by-products and/or along with by-products resulting from the manufacture of such composition. It is respectfully submitted that there is no basis in the prior art to make a selection of these two particular compounds. Banyai does not discuss any binding effect of these compounds; instead, it discloses binder additives of clay or flux in a separate section of the patent. Indeed, Banyai leads away from making such selection because one of the two compounds, sodium citrate, is actually utilized in comparative examples in the reference. This is a direct teaching away and votes more strongly against such selection than that in In re Baird where a lack of motivation was found where the compound was not listed along with preferred compounds in addition to considering the number of compounds in the genus. In re Baird,29 USPQ2d 1550 at 1552 (Fed. Cir. 1994).

B. Sodium citrate is not citric acid

As the Examiner admits, "Banyai et al does not explicitly disclose, as in Claim 1, a process of commingling metallic ore with a moistening effective

amount of water and a binding effective amount of a weak acid." Page 2 of the Final Action, second full paragraph (emphasis in original). In an attempt to make up for this lack of disclosure, the Examiner alleges that "it reasonably appears that metal ions in the water will combine with the acid to form a salt such that the recitation of adding these components such as citric acid is tantamount to reciting that a salt of a weak acid is added." Id.

All claim limitations must be taught or suggested by the prior art in order to establish a prima facie case of obviousness. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

The claimed weak acid of citric acid, malic acid and or tartaric acid is not disclosed in Banyai. According to the rejection, the skilled artisan would have to ignore any direct teaching in Banyai to add a salt and, instead, employ an acid. It was requested (in the Amendment filed July 20, 2001, page 3) that the Examiner provide an affidavit to support the allegation that "it reasonably appears that metal ions in the water will combine with the acid to form a salt such that the recitation of adding these components such as citric acid is tantamount to reciting that a salt of a weak acid is added." Page 2 of the Final Action, second full paragraph. The Examiner responded that such an affidavit is not necessary since "[s]odium citrate is a known water soluble acid salt which when dissolved results in an acidic solution." Final Action page 3.

In other words, the Examiner is saying that the salt, sodium citrate, would form an acid in water. However, the rejection is based on the contention that the acid would form a salt in water. Accordingly, it is submitted that there is no support for the position that the acid forms a salt and, thus, there is no support for the rejection.

Simply put, the prior art does not indicate that disclosure of a salt teaches or suggests an acid. There also is no reason to ignore any teaching in Banyai, if

indeed there is any, to use a salt. Thus, in addition to a lack of technical support for the Examiner's position, there is no reason that Banyai's sodium citrate teaches or suggests the claimed weak acid of citric acid, malic acid or tartaric acid. Accordingly, if Banyai is deemed to disclose a process utilizing a binding effective amount of sodium citrate (which is disputed above), it does not thereby teach or suggest a process employing a binding effective amount of citric acid, as claimed.

C. Unexpected results

The claimed process of agglomerating metallic ore utilizing a binding effective amount of guar and/or its derivatives and a binding effective amount of a weak acid of citric acid, malic acid, and/or tartaric acid unexpectedly results in agglomerates with a higher drop number and dry crush strength than guar, or its derivatives, alone. It is unexpected that these weak acids would have any effect on guar's binding properties, since while polymeric binders are known, it is not known to combine such a binder with a weak acid of citric acid, malic acid, and/or tartaric acid. See pages 1-3 of the specification. Thus, comparison between guar or its derivatives alone and with a weak acid of citric acid, malic acid, and/or tartaric acid constitutes a comparison of the closest prior art.

The advantages of employing citric acid and guar or its derivatives are seen in Table 1 where agglomerates made using guar alone, examples 1 and 6, have drop #s of 9.3 and 9.9, respectively, while those made with citric acid too, examples 2-4 and 7-10, have drop #s of 11.0, 13.5, 16.5, 11.0, 17.4, 14.4 and 14.4, respectively. Page 10 of the specification.

These advantages are also seen in Table 1 where agglomerates made using guar alone, examples 1 and 6, have dry crush strengths of 2.0 and 2.1, respectively, while those made with citric acid too, examples 2-4 and 7-10, have dry crush strengths of 3.3, 5.3, 6.7, 3.5, 4.5, 6.2 and 6.7, respectively. Page 10 of the specification.

Further, these advantages are seen in Table 1 for guar derivatives. CM guar alone, example 15, has a drop # of 11.4 and a dry crush strength of 2.5, while CM guar with citric acid, example 16, has a drop # of 16.7 and a dry crush strength of 4.8. Page 10 of the specification.

These advantages are also seen in Table 1 for HP guar, another guar derivative. In example 27, HP guar alone has a drop # of 7.1 and a dry crush strength of 2.6, while HP guar with citric acid, example 28, has a drop # of 13.0 and a dry crush strength of 5.1. Page 10 of the specification.

Still further, these advantages are seen in Table 2 for guar with tartaric or malic acid. In examples 35 and 36, guar alone has a drop # of 8.8 and 9.3, respectively, and a dry crush strength of 1.9 and 2.0, respectively, while guar with tartaric acid, example 37, has a drop # of 10.2 and a dry crush strength of 4.4. Guar with malic acid, example 39, has a drop # of 15.4 and a dry crush strength of 4.4. Page 11 of the specification.

These advantages are also seen in Table 2 for CM guar with tartaric acid. In example 40, CM guar alone has a drop # of 11.4 and a dry crush strength of 2.5, while CM guar and tartaric acid has a drop # of 10.2 and a dry crush strength of 4.7 (it maintains a high drop # while increasing crush strength). Page 11 of the specification.

The results are favorable for guar and its derivatives (CM guar and HP guar being examples thereof) with citric acid, tartaric acid or malic acid, as claimed. Accordingly, the results are commensurate in scope with the claims.

X. CONCLUSION

In view of the arguments presented hereinabove appellants respectfully submit that claims 1, 3, 7, 8, 45 and 50 stand improperly rejected over the applied art. The Honorable Board is therefore respectfully requested to reverse the Examiner and pass claims 1, 3, 7, 8, 45 and 50 to issue.

Respectfully submitted,

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XI. APPENDIX

CLAIMS

1. A process of agglomerating metallic ore, said process comprising commingling said metallic ore with a moistening effective amount of water and a binder consisting of a binding effective amount of a polymer selected from the group consisting of guar, guar derivatives and mixtures thereof, and a binding effective amount of a weak acid selected from the group consisting of citric acid, malic acid, tartaric acid and mixtures thereof to produce a mixture and forming said mixture into agglomerates.

2. The process of Claim 1 wherein said metallic ore is iron.

3. The process of Claim 1 wherein said polymer and said weak acid together are about 0.01 to about 1.0 wt% of said mixture.

4. The process of Claim 1 wherein the metallic ore is comprised of iron ore, the polymer is comprised of guar and the weak acid is comprised of citric acid.

5. The process of Claim 1 wherein said guar derivative is selected from the group consisting of carboxymethyl guar, hydroxypropyl guar and mixtures thereof.

50. (A process of agglomerating metallic ore, said process comprising commingling said metallic ore with a moistening effective amount of water, a binding effective amount of guar, guar derivatives or mixtures thereof, and a binding effective amount of malic acid, tartaric acid or mixtures thereof to produce a mixture and forming said mixture into agglomerates.

and a binder consisting of

citric acid

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